
6 Weather Influence

Cold Weather Fabrication

Hot Weather Fabrication

CHAPTER SIX:

WEATHER INFLUENCE

COLD WEATHER FABRICATION

Structural members poured in cold weather are required to meet the requirements for cold weather structural concrete detailed in Sections **707.07** and **702.11**. When concrete is placed at or below 35°F, the water and or aggregates may be heated to no more than 150°F. Forms may be covered with tarps and the area within and around the forms may be heated to above 35°F by means of steam, radiant heat, or forced air. Concrete is required to be delivered immediately after the removal of the tarps. The tarps are replaced as soon as possible after placing of the concrete. The temperature of the heated concrete is required to be between 50°F and 90°F when heated water or aggregates are used. The use of calcium chloride to accelerate hardening of the concrete is not permitted under any circumstances.

HOT WEATHER FABRICATION

When structural members are fabricated during hot weather, the steel form work may become very hot. The forms may be cooled by means of spraying with a fine mist of water and/or using reflective tarps. Any concrete deposited on the tops of the forms is required to be scraped off the top flanges before the concrete begins to cure. "Hot spots" (Figure 6-1) form on the underside of the top flanges when splatters of concrete remain on top of the hot steel forms before the concrete fills the remainder of the form. Figure 6-2 is a close-up picture of a hot spot.



Figure 6-1. Top Flange Hot Spots



Figure 6-2. Hot Spot

There is a correlation between hot weather and decreasing amounts of entrained air retained in the concrete. Additional air tests may be required to ensure the air content is within specification requirements.

If the temperatures are too high and concrete cannot be produced at a temperature of 90°F or lower at the time of placement, the Fabricator is required to wait until the ambient temperatures are cooler. Usually, the material component that retains the most heat is the cement. If the cement is already too hot before being incorporated into the concrete, the concrete will likely exceed the maximum allowable temperature of 90°F.

When temperatures are beginning to approach the hot extremes of the specification requirements, the thermometers may need to be re-calibrated at higher temperatures.